

Trends in children's attendance at hospital Accident and Emergency Departments for unintentional poisoning from 1990 to 1999 in the UK

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1. Introduction

Poisoning in children is a significant cause of morbidity. In 1999, an estimated 31 186 children aged 0–14 years attended Accident and Emergency (A&E) Departments in the UK following a poisoning (Department of Trade and Industry 2001). It is the second most common injury mechanism resulting in hospital admission in childhood (Hippisley-Cox *et al.* 2002) with 30% of 0–4 years olds attending A&E in 1999 being admitted (Department of Trade and Industry 2001). The most recent UK study examining trends in admission rates for poisoning amongst children aged under 5 years found that they declined by 7.7% between 1976 and 1986 (Sellar *et al.* 1991). However, admission rates for poisoning in Australia in children aged under 5 years increased over the period from 1987 to 1995 (Hoy *et al.* 1999). A&E attendance rates for childhood poisonings declined between 1982 and 1996 (Department of Trade and Industry 1999). However, there is no information on trends in childhood poisonings by specific agents. The authors were therefore interested in examining recent trends in poisoning attendances at A&E departments in children affected by a poisoning agent.

2. Methods

Anonymous patient data were obtained from the UK Government's Department of Trade and Industry, which

were collected for their Home Accident Surveillance System (HASS) from 1990 to 1999 (Department of Trade and Industry 2001). These data were based on children aged from 0 to 14 years with non-fatal unintentional home accidents who attended 18 A&E departments across the UK.

The participants (or accompanying parent or adult) were interviewed as soon as possible after attending A&E using a standard questionnaire (Department of Trade and Industry 2001); otherwise information was obtained from medical records. Changes to the HASS coding system in 1993 and 1994 meant that trends in substances and outcomes from 1993 and 'inpatient for less than 1 day' from 1994 were examined. As the number of attendances at A&E departments was small (≤ 40 per year) for some substances for some age groups, analyses of trends were limited to children aged 0–4 years and 5–9 years for medicinal products and to those aged 0–4 years for poisonings from household chemicals, toiletries, vegetation, garden chemicals and solvents.

Estimates of national A&E attendance rates for poisoning in the 5-year age groups were calculated. The trends were investigated over time using negative binomial regression with the national estimate of the rate of poisoning attendances for the appropriate age group as the dependent variable, year as the explanatory variable and using the UK population estimate (Office for National Statistics 2003) of the appropriate age group as the offset term. Analyses were undertaken using STATA 7.

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Ethical committee approval was gained from the Trent Multi-centre Research Ethics Committee in the UK.

3. Results

Poisoning was the sixth most common injury mechanism resulting in attendance at A&E (3.6% of all injury attendances). Over the 10-year period 21 228 children aged 0–14 years attended HASS A&E departments following a poisoning, giving an estimate of 425 321 attendances for poisoning in this age group across the UK.

Figure 1 shows a significant reduction in the attendance rates for poisoning for children aged 0–4 and 5–9 years between 1990 and 1999. Attendance rates reduced for children aged 0–4 years by 4% per year (incidence rate ratio (IRR) 0.96, 95% CI 0.94 to 0.98) and for those aged 5–9

years by 5% per year (IRR 0.95, CI 0.92 to 0.98). There were no significant trends over time for those aged 10–14 years.

Medicines (7842, 56.2%) and household chemicals (1716, 12.3%) were the most common substances involved in poisoning attendances (see table 1). Attendance rates for poisoning from medicines reduced significantly in the 0–4 and 5–9 year groups by 8% per year (IRR 0.92, 95% CI 0.89 to 0.96 and IRR 0.92, 95% CI 0.87 to 0.97, respectively).

Attendance rates involving household chemicals reduced significantly among children aged 0–4 years by 5% per year (IRR 0.95, 95% CI 0.92 to 0.97). There were also significant reductions in attendance rates for those aged 0–4 years for toiletries by 6% per year (IRR 0.94, 95% CI 0.90 to 0.99) and for vegetation and garden chemicals by 5% per year (IRR 0.95, 95% CI 0.93 to 0.98 and IRR 0.95,

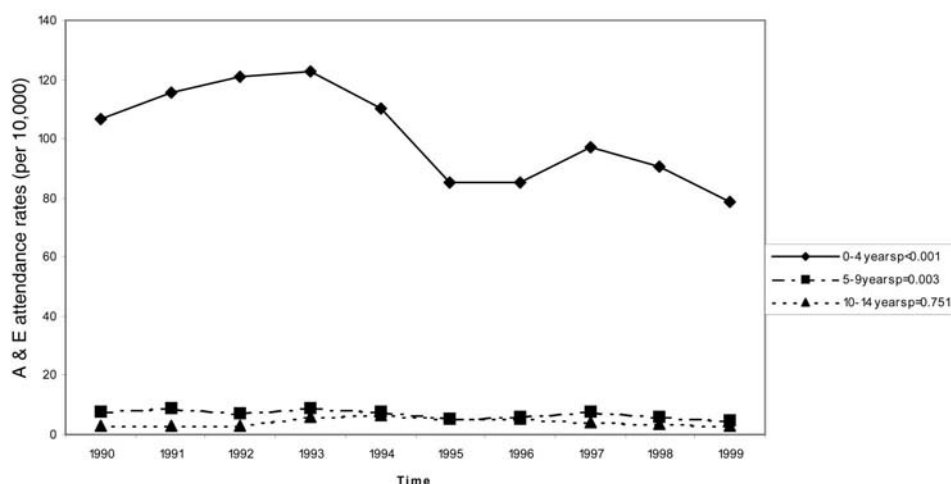


Figure 1. Trend in A&E attendance rates in unintentional poisoning by age groups.

Table 1. Substances involved in poisoning attendances at A&E departments in hospitals participating in HASS between 1993 and 1999.

Substance	Number (%)				UK estimates
	Total	0–4 years	5–9 years	10–14 years	
Medicines	7,842 (56.2)	7,082 (56.8)	450 (51.5)	310 (50.1)	158,486
Household chemicals	1,716 (12.3)	1,606 (12.9)	77 (8.8)	33 (5.3)	34,503
Toiletries	739 (5.3)	699 (5.6)	27 (3.1)	13 (2.1)	14,892
Solvents	616 (4.4)	585 (4.7)	29 (3.3)	2 (0.3)	12,263
Vegetation	491 (3.5)	424 (3.4)	57 (6.5)	10 (1.6)	9,858
Garden chemicals	372 (2.7)	346 (2.8)	23 (2.6)	3 (0.5)	7,492
Alcohol	204 (1.5)	47 (0.4)	30 (3.4)	127 (20.5)	4,139
Food	153 (1.1)	124 (1.0)	16 (1.8)	13 (2.1)	3,032
Fuel	143 (1.0)	105 (0.8)	19 (2.2)	19 (3.1)	2,843
Fixing materials	88 (0.6)	81 (0.6)	4 (0.5)	3 (0.5)	1,732
Corrosives	29 (0.2)	27 (0.2)	1 (0.1)	1 (0.2)	571
Others	878 (6.3)	709 (5.7)	103 (11.8)	66 (10.7)	17,582
Unspecified	685 (4.9)	628 (5.0)	38 (4.3)	19 (3.1)	13,576
Total	13,956	12,463	874	619	280,969

95% CI 0.91 to 1.00, respectively). Attendance rates for poisoning by solvents did not change significantly (IRR 1.01, 95% CI 0.98 to 1.04).

Poisoning incidents were largely managed in the A&E departments. Over half of the attendances were examined and treated there (4228, 30.3%) or were examined but treatment was not required (3235, 23.2%). Of all attendances with poisoning, 27.1% (3786) resulted in an admission to hospital. Between 1993 and 1999 there were significant reductions in those being examined and requiring treatment by 11% per year (IRR 0.89, 95% CI 0.83 to 0.94) and those requiring an admission greater than 1 day by 10% per year (IRR 0.90, 95% CI 0.86 to 0.94). There was a significant increase in those who were inpatients for less than 1 day from 1994 by 23% per year (IRR 1.23, 95% CI 1.03 to 1.48). There was no change in those being examined and not requiring treatment in A&E (IRR 1.00, 95% CI 0.98 to 1.02).

4. Discussion

The reduction that was found in attendance rates for poisoning amongst children aged 0–4 and 5–9 years may reflect a true reduction in the incidence of poisoning. The incidence of poisoning may have declined for several reasons including: reduced exposure to poisons through the increasing use of child-resistant closures and blister packs for medication; reductions in the quantity of medication per prescription; changes in the storage of potentially hazardous substances; or in an increase in out-of-home day care.

However, the reduction in attendance may also reflect changes in the pattern of health service use for poisonings due to the development of alternative services such as telephone advice services (NHS Direct) and open access medical centres (walk-in centres). The increased availability of health information to families via the Internet may also have contributed to a decline in A&E attendance rates.

Declining admission rates may be partly explained by the introduction of short-stay A&E or medical observation

wards, the increased use of computer-assisted toxicological information (TOXBASE) in A&E departments in the UK and the development of local guidelines for the management of poisoning.

Although poisoning attendance and admission rates have declined, continued efforts are still needed to prevent poisoning in childhood. Whilst child-resistant containers and the use of blister packs for medication play an important preventative role, it is important to remember that such measures are not 'child proof'. The safe storage of hazardous substances remains essential and strategies to increase safe storage require evaluation.

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